

A NEW PSEUDOTHELPHUSID CRAB FROM A
CAVE IN SOUTHERN COSTA RICA
(DECAPODA: BRACHYURA)

H. H. Hobbs III

Abstract.—A new species of troglophilic freshwater crab, *Pseudothelphusa puntarenas*, is described from Emus Cave in Provincia de Puntarenas, Costa Rica, Central America. This crab lacks any obvious external troglomorphic modifications, but is not yet known from epigean waters. The affinities of *P. puntarenas* with other pseudothelphusids are discussed.

Since the publication of the monograph on the Pseudothelphusidae by Rodríguez (1982), only three new species of *Pseudothelphusa* have been described (Alvarez 1987, 1989; Alvarez & Villalobos 1990), all from southern Mexico. During a joint Asociación Espeleológica Costarricense—National Speleological Society Expedition to Costa Rica, a fourth species, described herein, was discovered from Emus Cave in Provincia de Puntarenas and represents the first cavernicolous pseudothelphusid known from Costa Rica. This species brings the total number of Central American (Mexico, Guatemala, Belize, and Costa Rica) cave pseudothelphusids to 16 (see also Reddell 1981, Rodríguez & Hobbs 1989a, 1989b). Information concerning other cavernicolous pseudothelphusids can be found in Rodríguez (1985, 1991) and Rodríguez & Bosque (1990). Terminology follows that used by Rodríguez (1982). The following abbreviations are employed: USNM, United States National Museum (Smithsonian Institution), Washington, D.C.; IVIC, Centro de Ecología, Instituto Venezolano de Investigaciones Científicas, Caracas, Venezuela; CL, carapace length; CW, carapace width.

Pseudothelphusa puntarenas, new species
Fig. 1

Description.—Superior frontal border of carapace (Fig. 1A, C) generally smooth, di-

vided medially by notch continuous with median groove. Inferior frontal border well defined, formed by small tubercles from which carapace rising steeply. Carapace surface (Fig. 1C) weakly convex with regions moderately well defined, gastric and branchial regions elevated; limits of epigastric regions rather obscure; broadly V-shaped cervical groove prominent, not reaching anterolateral margin. Anterolateral margin rather evenly rounded with 8–12 small denticles between orbit and cervical groove. Pterygostomian region densely setose (Fig. 1A). Third maxilliped (Fig. 1A, L) with exopod greater than half length of ischium; ischium/exopod ratio varying from 53.4–64.3, average 59.3. Chelipeds unequal, right chela (Fig. 1B) generally more robust than left with mildly sinuous ventral margin; fingers of major chelae gaping, curved, and weakly punctate; teeth on opposable cutting surfaces of finger of moderate size. Ventral view of body as in Fig. 1K. Eyes well developed, pigmented; carapace mottled with tan, brown, and reddish-brown pigmentation.

First male gonopod (Fig. 1D–G) with distal half arched laterally and with prominent triangular-shaped cephalic process; reniform mesial process well developed. Gonopod bearing short, stiff setae on middle part of mesial margin and few long setae on proximal half; apical cavity (Fig. 1J) elongated along caudo-cephalic axis, bearing se-

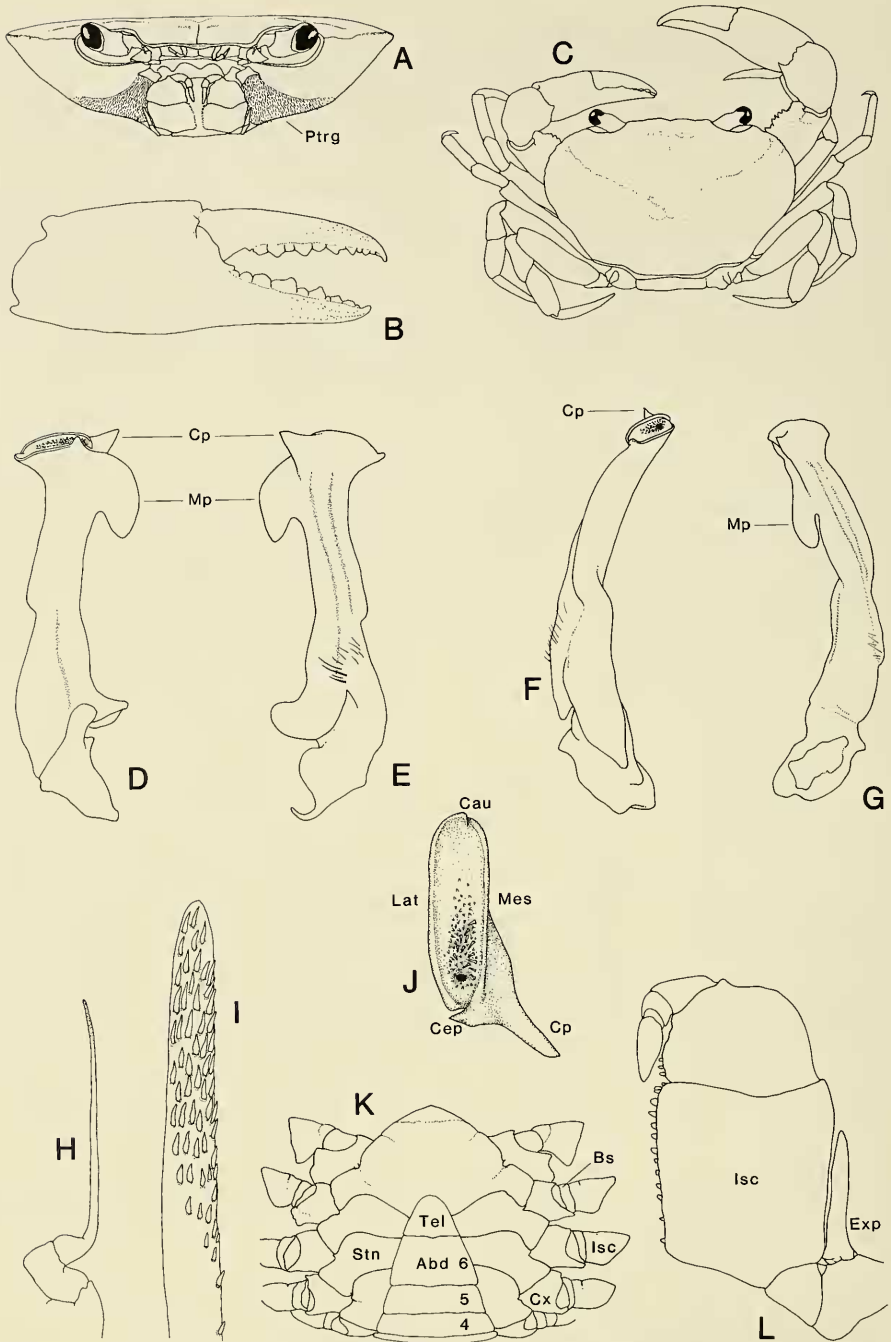


Fig. 1. *Pseudothelphusa puntarenas*, new species: A, frontal view of carapace, orbital and buccal region; B, right chela; C, dorsal view of crab; D, lateral view of left first gonopod of male; E, mesial view of same; F, caudal view of same; G, cephalic view of same; H, caudal view of male second gonopod; I, distal part of male second gonopod; J, apical view of male left first gonopod; K, sternum and abdomen, ventral view; L, left third maxilliped (setae not shown). (Abd: Abdomen; Bs: Basis; Cau: Caudal; Cep: Cephalic; Cp: Cephalic process; Cx: Coxa; Exp: Exopod; Isc: Ischium; Lat: Lateral; Mes: Mesial; Mp: Mesial process; Ptrg: Pterygostomian region with setae; Stn: Sternite; Tel: Telson).

tae over middle and cephalic end of cavity; terminal pore setae most densely distributed toward cephalomesial portion of cavity; borders of cavity of equal thickness with mesial one slightly elevated above lateral border; opening of sperm channel situated cephalically. Second male gonopod (Fig. 1H, I) extending to or slightly beyond apical end of gonopod; terminal part covered by numerous oblique rows of closely arranged spinules.

Type material.—Holotype: male, CL = 11.7 mm, CW = 18.3 mm, USNM 250555; paratypes: 3 males, CL = 9.7, 12.95, 8.3 mm, CW = 15.4, 21.5, 13.0 mm; 7 females, CL = 8.2, 10.5, 13.9, 15.9, 13.5, 11.2, 13.7 mm, CW = 12.9, 16.0, 22.6, 25.9, 22.1, 18.1, 22.1 mm, USNM; 1 male, IVIC.

Type locality.—Small stream in Emus Cave, Provincia de Puntarenas, Costa Rica. The crabs were found approximately 120 m from the entrance in pools and small riffle areas with rubble-cobble-gravel limestone substrates. The stream in Emus Cave on 1 January 1989 (temperature 24.3°C) resurged about 23 m in elevation below the entrance and flowed directly into the Rio Claro. A species of *Macrobrachium* (probably *M. carcinus* (Linnaeus)) was observed but not collected, as were individuals of an unidentified catfish.

Etymology.—This species is named for the Province, Puntarenas, where the cave is located in southwestern Costa Rica.

Relationships.—Although few external morphological characteristics have been demonstrated to have taxonomic value within the pseudothelphusids (Rodríguez 1982), the gonopod, however, has proven to be an important structure for distinguishing species. The distal part of the gonopod of the male of *P. puntarenas* shows similarities to that of *P. leiophrys* Rodríguez & Smalley, 1969, *P. galloi* Alvarez & Villalobos, 1990, *P. granatensis* Rodríguez & Smalley, 1969, *P. jouyi* Rathbun, 1893, *P. parabelliana* Alvarez, 1989, and *P. mexicana* Alvarez, 1987. The gonopods of all

these species have a well developed mesial process but in *P. puntarenas*, *P. galloi*, and *P. leiophrys* the outer margin is smooth, whereas it is serrate in the other species. The apex of the gonopod of *P. mexicana*, *P. parabelliana*, and *P. granatensis* has a well developed lateral lobe with three, two, and two projections, respectively, while *P. puntarenas* lacks a well developed lateral lobe. In general, the gonopod morphology of *P. puntarenas* is closer to that of *P. leiophrys*, but can easily be separated from it by the well developed cephalic process in *P. puntarenas*.

Acknowledgments

Appreciation is extended to the members of the 1989 Asociación Espeleológica Costarricense—National Speleological Society Expedition for their assistance in the field. Special thanks are extended to D. Dotson, Expedition Leader, who invited me to go to Costa Rica and to F. Grady who helped collect the crab specimens. I am also grateful to H. H. Hobbs, Jr., and G. Rodríguez for their criticisms of the manuscript. This work was supported in part by grants received from The Faculty Research Fund Board and the Faculty Development Organization of Wittenberg University.

Literature Cited

- Alvarez, F. 1987. *Pseudothelphusa mexicana*, a new freshwater crab from the State of Guerrero, Mexico (Brachyura: Pseudothelphusidae).—Proceedings of the Biological Society of Washington 100:1–3.
- . 1989. *Smalleyus tricristatum*, new genus, new species, and *Pseudothelphusa parabelliana*, new species (Brachyura: Pseudothelphusidae) from Los Tuxtlas, Veracruz, Mexico.—Proceedings of the Biological Society of Washington 102:45–49.
- , & J. Villalobos. 1990. *Pseudothelphusa galloi*, a new species of freshwater crab (Crustacea: Brachyura: Pseudothelphusidae) from southwestern Mexico.—Proceedings of the Biological Society of Washington 103:103–105.
- Rathbun, M. 1893. Descriptions of new species of American fresh-water crabs.—Proceedings of the

- United States National Museum 16(959):649–661.
- Reddell, J. R. 1981. A review of the cavernicole fauna of Mexico, Guatemala, and Belize.—*Bulletin of the Texas Memorial Museum* 27:1–327.
- Rodríguez, G. 1982. Les crabes d'eau douce d'Amérique. Famille des Pseudothelphusidae.—*Office de la Recherche Scientifique et Technique Outre-Mer, Faune Tropicale* 22:1–223.
- . 1985. A new cavernicolous crab (Crustacea, Decapoda, Pseudothelphusidae) from Columbia.—*Biologia Vest* 33(2):73–80.
- . 1991. The freshwater crabs of America: Family Trichodactylidae, and supplement to the family Pseudothelphusidae.—*Faune Tropicale ORSTOM* (in press).
- , & C. Bosque. 1990. A stygobiont crab, *Chaceus caecus* n. sp., and its related stygophile, *Chaceus motiloni* Rodriguez, 1980, (Crustacea, Decapoda, Pseudothelphusidae) from a cave in the Cordillera de Perija, Venezuela.—*Mémoires de Biospeologie* 17:127–134.
- , & H. H. Hobbs, Jr. 1989a. A new cavernicolous crab, *Zilchia falcata*, from Guatemala, with notes on the genera of the Potamocarcinini (Crustacea, Decapoda, Pseudothelphusidae).—*Bulletin du Museum National d'Histoire Naturelle*, 4th Serie 11(1):183–192.
- . 1989b. Freshwater crabs associated with caves in southern Mexico and Belize, with descriptions of three new species (Crustacea: Decapoda).—*Proceedings of the Biological Society of Washington* 102:394–400.
- , & A. E. Smalley. 1969. Los Cangrejos de agua dulce de México de la familia Pseudothelphusidae (Crustacea, Brachyura).—*Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Ciencias Mar y Limnología* 40:69–112.

Department of Biology, Wittenberg University, P.O. Box 720, Springfield, Ohio 45501-0720.